

CLAIMS

1. A system for transmitting color images comprising:
 - an image capture device for receiving at least one color image;
 - a gray scale image generator for removing color data from said image to produce gray scale version of said image;
 - a first region detection device for identifying a plurality of arbitrarily-shaped discrete regions of said image and generating a region map, wherein each of said plurality of discrete regions of said region map encompass a portion of said gray scale image having a particular common value;
 - a color region list compiler for compiling a color region list associating each of said plurality of regions with a color value;
 - a transmission device for transmitting said gray scale version of said image and said color region list;
 - a reception device for receiving said gray scale version of said image and said color region list;
 - a second region detection device for identifying said plurality of arbitrarily-shaped discrete regions of said image identified by said first region detection device and generating said region map; and
 - a color assignment device which receives said color region list and assigns a color value to each of said plurality of regions in said region map, based on information in said color region list to generate a colored region image.
2. The system of claim 1 wherein said particular common value is one of a luminance value of the region and a textural value of the region.
3. The system of claim 2 further comprising a camera for inputting video images into said image capture device.

4. The system of claim 2 further comprising a compression device for receiving said gray scale version of said image and said color region list and generating a compressed signal for transmission to said reception device.

5. The system of claim 2 wherein, in a first iteration, said first and second region detection devices scan said gray scale image from a first point of said gray scale image to a second point of said gray scale image and generate said region map at a low resolution, and in further iterations, said first and second region detection devices scan each of said regions identified in a preceding iteration at successively higher resolutions, to identify further regions within said region map.

6. The system of claim 2 wherein each region of said region map includes a unique identification index and said color region list includes said unique identification indices and an associated color value for each region.

7. The system of claim 6 wherein said color value associated with each region comprises an average of color values included within each region.

8. The system of claim 2 further comprising a colored region image generator for generating a colored region image, said colored region image including said color values for each of said discrete regions.

9. The system of claim 8 further comprising a color region linking device for linking each of said color values in said colored region image with an associated discrete region in said region map, wherein each linked color region is input to said color region list compiler.

10. The system of claim 2 further comprising an image summer for combining said gray scale image and said colored region image to generate a final colored image; and a display device for receiving and displaying said final colored image.

11. A method of transmitting color images comprising:
- A. receiving at least one color image;
 - B. removing color data from said image to produce a gray scale version of said image;
 - C. identifying a plurality of arbitrarily-shaped discrete regions of said gray scale image and generating a region map, wherein each of said plurality of discrete regions of said region map encompass a portion of said gray scale image having a particular common value;
 - D. determining a color value in each of said plurality of regions, based on color information in said color image;
 - E. compiling a color region list associating each of said plurality of regions with a color value;
 - F. transmitting said gray scale version of said image and said color region list;
 - G. receiving said gray scale version of said image and said color region list;
 - H. identifying said plurality of arbitrarily-shaped discrete regions of said gray scale image identified by said first region detection device and generating said region map; and
 - I. assigning a color value to each of said plurality of regions in said region map, based on information in said color region list.
12. The method of claim 11 wherein said particular common value is one of a luminance value of the region and a textural value of the region.
13. The method of claim 12 further comprising, prior to step F, compressing said gray scale version of said image and said color region list to generate a compressed signal for transmission to said reception device.
14. The method of claim 13 wherein, in a first iteration, said first and second region detection devices scan said gray scale image from a first point of said gray scale

image to a second point of said gray scale image and generate said region map at a low resolution, and in further iterations, said first and second region detection devices scan each of said regions identified in a preceding iteration at successively higher resolutions, to identify further regions within said region map.

15. The method of claim 12 wherein each region of said region map includes a unique identification index and said color region list includes said unique identification indices and an associated color value for each region.

16. The method of claim 15 wherein said color value associated with each region comprises an average of color values included within each region.

17. The method of claim 12 further comprising, prior to step D, generating a colored region image, said colored region image including said color values for each of said discrete regions.

18. The method of claim 17 further comprising, prior to step E, linking each of said color values in said colored region image with an associated discrete region in said region map, wherein each linked color region is input to said color region list compiler.

19. The method of claim 12 further comprising, after step I, combining said gray scale image and said colored region image to generate a final colored image; and displaying said final colored image.

20. A system for transmitting color images comprising:

- an image capture device for receiving at least one color image;
- a gray scale image generator for removing color data from said image to produce gray scale version of said image;
- a first region detection device for identifying a plurality of arbitrarily-shaped discrete regions of said image and generating a region map, wherein each of said plurality of discrete regions of said region map encompass a portion of said gray scale image having a particular luminance value;
- a color region list compiler for compiling a color region list associating each of said plurality of regions with a color value;
- a transmission device for transmitting said gray scale version of said image and said color region list;
- a reception device for receiving said gray scale version of said image and said color region list;
- a second region detection device for identifying said plurality of arbitrarily-shaped discrete regions of said image identified by said first region detection device and generating said region map; and
- a color assignment device which receives said color region list and assigns a color value to each of said plurality of regions in said region map, based on information in said color region list to generate a colored region image.

21. A system for transmitting color images comprising:

- an image capture device for receiving at least one color image;
- a gray scale image generator for removing color data from said image to produce gray scale version of said image;
- a first region detection device for identifying a plurality of arbitrarily-shaped discrete regions of said image and generating a region map, wherein each of said plurality of discrete regions of said region map encompass a portion of said gray scale image having a particular textural value;

a color region list compiler for compiling a color region list associating each of said plurality of regions with a color value;

a transmission device for transmitting said gray scale version of said image and said color region list;

a reception device for receiving said gray scale version of said image and said color region list;

a second region detection device for identifying said plurality of arbitrarily-shaped discrete regions of said image identified by said first region detection device and generating said region map; and

a color assignment device which receives said color region list and assigns a color value to each of said plurality of regions in said region map, based on information in said color region list to generate a colored region image.

22. A system for transmitting color images comprising:

an image capture device for receiving at least one color image;

a gray scale image generator for removing color data from said image to produce gray scale version of said image;

a first region detection device for identifying a plurality of arbitrarily-shaped discrete regions of said image and generating a region map, wherein each of said plurality of discrete regions of said region map encompass a portion of said gray scale image having a particular common value;

a colored region image generator for generating a colored region image, said colored region image including color values for each of said discrete regions.

a color region list compiler for compiling a color region list associating each of said plurality of regions with said color values;

a transmission device for transmitting said gray scale version of said image and said color region list;

a reception device for receiving said gray scale version of said image and said color region list;

a second region detection device for identifying said plurality of arbitrarily-shaped discrete regions of said image identified by said first region detection device and generating said region map; and

a color assignment device which receives said color region list and assigns a color value to each of said plurality of regions in said region map, based on information in said color region list to generate a colored region image.

23. The system of claim 22 wherein said particular common value is one of a luminance value of the region and a textural value of the region.

24. The system of claim 23 further comprising a camera for inputting video images into said image capture device.

25. The system of claim 23 further comprising a compression device for receiving said gray scale version of said image and said color region list and generating a compressed signal for transmission to said reception device.

26. The system of claim 23 wherein, in a first iteration, said first and second region detection devices scan said gray scale image from a first point of said gray scale image to a second point of said gray scale image and generate said region map at a low resolution, and in further iterations, said first and second region detection devices scan each of said regions identified in a preceding iteration at successively higher resolutions, to identify further regions within said region map.

27. The system of claim 23 wherein each region of said region map includes a unique identification index and said color region list includes said unique identification indices and an associated color value for each region.

28. The system of claim 27 wherein said color value associated with each region comprises an average of color values included within each region.

29. The system of claim 23 further comprising a color region linking device for linking each of said color values in said colored region image with an associated discrete region in said region map, wherein each linked color region is input to said color region list compiler.

30. The system of claim 23 further comprising an image summer for combining said gray scale image and said colored region image to generate a final colored image; and a display device for receiving and displaying said final colored image.

31. A method of transmitting color images comprising:

- A. receiving at least one color image;
- B. removing color data from said image to produce a gray scale version of said image;
- C. identifying a plurality of arbitrarily-shaped discrete regions of said gray scale image and generating a region map, wherein each of said plurality of discrete regions of said region map encompass a portion of said gray scale image having a particular luminance value;
- D. determining a color value in each of said plurality of regions, based on color information in said color image;
- E. compiling a color region list associating each of said plurality of regions with a color value;
- F. transmitting said gray scale version of said image and said color region list;
- G. receiving said gray scale version of said image and said color region list;
- H. identifying said plurality of arbitrarily-shaped discrete regions of said gray scale image identified by said first region detection device and generating said region map; and
- I. assigning a color value to each of said plurality of regions in said region map, based on information in said color region list.